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Editorial

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AI in education: Challenges, opportunities, and possibilities

Artificial Intelligence (AI) has become an integral part of everyday life, with its rapid development far outpacing policy discussions and the establishment of regulatory frameworks. As AI technologies advance, education practitioners increasingly encounter the presence and integration of AI technologies in their professional practice, raising profound questions about teaching, learning, the evolving role of educators, and the broader social and ethical implications of its application. To navigate this shift effectively, it is crucial for education practitioners to understand the pedagogical affordances of AI—not only to complement and enhance their teaching strategies but also, to critically engage with its impact on educational equity and inclusion.

While the growing prevalence of AI-powered tools presents transformative opportunities for teaching and learning, it also introduces ethical concerns regarding the responsible use of AI in education. This duality underscores the urgent need for research into how AI integration affects instructional activities, operational procedures, and student experiences—particularly within higher education and South Africa's schooling sector. Thus, rigorous inquiry is essential to interrogate discourse on AI in education and to inform evidence-based policies that ensure ethical and equitable AI adoption. Recognising these challenges and opportunities, we, as guest editors, proposed this special issue to critically explore AI in

education—its implications, possibilities, and challenges in fostering inclusive, equitable, and high-quality education.

At the start of 2024, we called for submissions through the South African Education Research Association community and *Journal of Education* to advance the discourse on AI in education. This initiative sought to foreground AI-related research, encourage interdisciplinary and multidisciplinary perspectives, and examine AI's evolving role in education. The rapid evolution of AI technologies has sparked discussions on their impact on the education sector and future educational policies. Therefore, this special issue acknowledges the need for empirical research to inform pedagogical practices and policy development, ensuring AI's ethical and responsible integration into education. Developing a nuanced understanding of AI's multifaceted benefits is crucial to maximising its potential while mitigating risks.

This special issue features eight peer-reviewed articles that employ rigorous scientific research methodologies to explore the intersection of AI and education. These contributions offer both empirical and conceptual insights, providing depth, critical engagement, and theoretical and practical frameworks for educators and practitioners. Through these articles, this special issue advances scholarly discourse on AI in education, supporting educators and policymakers in navigating AI's challenges and opportunities in shaping the future of learning.

The first article, "AI and Higher Education: A Diffractive Reading" by du Preez, le Grange, and Visser interrogates AI as a transformative enabler rather than a mere technological advancement, and uncovers an entanglement of AI with research, curriculum work, and pedagogy. Through the diffractive methodology, this research highlights the performativity of AI and the imperative of reconfiguring higher education to embrace complexity, relationality, and ethical response-ability. This article contributes a posthumanist critique of the affordances of AI, challenging the neoliberal and instrumentalist paradigms that dominate current higher education practices. Additionally, the article provides practical insights into the ethical and ecological implications of the application of AI in higher education contexts.

The second article, "Artificial Intelligence in Education: Considerations for South African Schooling" by Cross and Feldman, explores AI in education (AIEd) in response to the controversies and changes sparked by ChatGPT within the field of education. This research provides a broad view of AIEd followed by a discussion on AIEd and its potential impact on South African schooling. The authors conclude that it is near impossible not to adopt or engage with new digital developments, however, professional development opportunities for both educators and students are critical in order to operate within the confines of privacy and confidentiality laws.

The third article, "Towards a Critical Discourse on Artificial Intelligence and its Misalignment in Sub-Saharan Africa: Through an Equality, Equity, and Decoloniality Lens" by authors Dlamini and Ndzinisa provides an argument on technological rationality in the discourse on AI in the education sector outside the socio-economic realities of sub-Saharan

Africa. Using an equality, equity, and decoloniality lens, the authors scrutinise the AI space in education, and unpack and delineate AI concepts. Their concluding argument is that any technological rationality in the emergence of AI could worsen existing disparities instead of fostering inclusivity.

This is followed by the article "A Scoping Review of the Integration of Artificial Intelligence in Primary and Secondary Schools From 2020 to 2024: Policy Implications for South Africa", by authors Saal, Chetty, Ntshayintshayi, Moosa, and Masuku. In this article, artificial intelligence (AI) is explored in relation to how it can enhance educational outcomes in South Africa. The key findings highlight the potential of AI to provide personalised learning experiences, strengthen inclusivity, and support special needs education. However, it was clear that effective AI deployment requires educators to develop technical skills and understanding of AI ethics to address biases and privacy issues.

The following article, "Faculty Perspectives on the Role of ChatGPT-4.0 in Higher Education Assessments" by Maistry and Singh, draws on the unified theory of acceptance and use of technology to explore the question of university academics' perspectives of the multifaceted impact of AI language models on educational assessment. This research aimed to determine university academics' perspectives on assessment in the context of radical innovations through AI technologies to establish proclivities for technology adoption and instructional practices. Through an online open-ended schedule of questions, the study revealed that AI could make student assessment processes more efficient and improve the quality of assessments by generating and validating multiple-choice questions, emphasising intrinsic motivation, and creating a more effective formative feedback process. In addition, the participants suggest that responsive institutional policies are needed.

The article "Postgraduate Students' Voices on Leveraging Grammarly as an AI-powered Tool in Academic Writing" by van Wyk employs an exploratory mixed-methods design to examine Grammarly's role as a paraphrasing tool for academic writing within an open-distance e-learning context. A sample of 34 respondents acknowledged Grammarly's effectiveness in enhancing academic writing, and enriching teaching and learning experiences. Furthermore, the article underscores the ethical considerations associated with Grammarly and other Generative AI (GenAI)-powered writing assistants, emphasising the need for careful evaluation before adoption in academic settings.

The article "Secondary School Students' Perceptions of Their Usage of Artificial Intelligence-Based ChatGPT in Mathematics Learning" by Egara, Mosimege, and Mosia examines secondary school students' perspectives on integrating AI-based ChatGPT into mathematics education. Using a mixed-methods design, the study reveals students' diverse views, acknowledging both benefits and concerns while confirming ChatGPT's role in enhancing comprehension and problem-solving skills. The authors emphasise the need for comprehensive training to improve ChatGPT's adaptability, promote critical inquiry, address ethical considerations, and support collaborative policy development.

Lastly, in the article "Student Perspectives on Optimising AI Tools to Enhance Personalised Learning in Higher Education," Hamilton and Mulaudzi apply the Technology Acceptance Model as a theoretical framework to examine students' acceptance and use of AI tools in education. This explanatory qualitative case study reveals that both students and lecturers require training to effectively integrate AI tools into learning environments. Additionally, the authors emphasise the importance of balancing AI-driven learning with traditional teaching methods to support personalised learning in higher education. They further suggest that institutions and lecturers must address the challenges posed by AI tools while simultaneously harnessing their full potential to create effective personalised learning environments.

The contributions in this special issue explore multiple dimensions, supported by multimodal data streams that enhance rigor and uphold sound scientific research methodologies. However, they also underscore the need for further empirical research to develop frameworks that effectively integrate AI into educational activities, particularly teaching and learning. Additionally, addressing the ethical and practical challenges of AI in education will require both technical expertise and deeper investigations into its pedagogical affordances beyond traditional literacies. Developing frameworks that promote equality and equity in AI-driven education will depend on large-scale data sets to inform ethical, practical, and methodological approaches.